REMARKS/ARGUMENTS

Claims 7-13 and 25 are rejected under 35 U.S.C. 102 (e) as being anticipated by Xue et al (U.S. 6,174,605). Claim 26 is rejected under 35 U.S.C. 103 (a) as being anticipated by Xue.

Independent claim has been amended to recite a 1000-1350 °C temperature range. Support for the added temperature limitations are found throughout the application and specifically on page 18, line 22, page 19, line 27, and page 20, line 13. Claim 7 has been further amended to recite verbatim the limitations in original claim 13; that is to say, claim 7 is now limited to a joint thickness that is at least five-times the size of the largest particle contained in the joint compound.

Claim 13 has been amended to recite a joint thickness that is between 5 and 500 times the size of the largest particle in the compound. Support for now amended claim 13 is found on page 8, lines 12-14 of the specification.

Claim 26 has been amended to recite 10 micron particle sizes when 65 volume percent of the joint compound contains particles exhibiting superplasticity. Support for the micron limitation is found on page 13, line 4-5.

Claim 27 has been added to recite 5 micron sizes when 65 volume percent of the joint compound contains particles exhibiting superplasticity and when 35 volume percent of the joint compound comprises fibers up to 500 microns in length. Support for this new claim 27 is found on page 13, lines 9-11.

Claims 28-30 have been added to recite specific process temperatures of less than 1450 C, 1000 C and 1350 C, respectively. Support for these limitations are found on page 12, lines 6-13, page 18, line 22, page 19, line 27, and page 20, line 13.

Xue is too hot

Claims 7-13 and 25 are rejected under 35 U.S.C. 102 (e) as being anticipated by Xue et al (U.S. 6,174,605). Applicants have amended independent claim 7 to recite a 1000-1350 °C temperature range. Newly added claims 28-30 recite less than 1450 C temperatures. By contrast, Xue espouses temperatures of "...as *low* as 1500 °C..." (Column 2, Lines 15-17) to produce a seamless construct. Thus, Xue teaches away

from the now claimed temperatures.

Xue believes that its 1500 °C temperature parameter is a breakthrough low temperature. This is because Xue relies on *reactive* processes instead of the Applicant's superplastic processes.

Generally, Xue teaches away from superplastic deformation processes such as that recited in claim 7. Instead, Xue relies on relatively high temperatures to facilitate "reactive-bonding" with objects it is joining, not superplastic deformation and particle sliding. It is noteworthy that all of Xue's examples require a "reactive-bonding compound slurry." To wit:

> "After application of the reactive-bonding layer, the parts are heated to a temperature sufficient to complete the bonding reaction, which occurs mostly within the joint interlayer, but also, to a small degree, between the layer and the carbon–carbon composite parts." (Column 3, lines 28-32.) (Emphasis mine.)

As further explained in the previously-submitted 1.132 Affidavit by co-inventor Jules Routbort, grain boundary sliding is inherent in superplastic processes. High temperatures, such as those used by Xue, would cause agglomeration of particles to occur, and therefore stymie grain boundary sliding seen in the instant superplastic deformation process.

Conversely, utilizing the now claimed 1000-1350 °C temperatures in Xue would render Xue useless inasmuch as the reactive process relied on in Xue would not occur. Xue relies on carbides, and carbides require relatively extremely high temperatures to react. If a prior art reference is cited that requires some modification in order to meet the claimed invention and such modification destroys the purpose of the invention disclosed in the reference, one of ordinary skill in the art would not find reason to make the proposed modification. In re Gordon 733 F. 2d 900 (Fed. Cir 1984).

In light of the foregoing, the Applicants submit that the now-recited low temperatures render claims 7-13 and 25-30 patentable over the art of record. Allowance is hereby solicited.

Notwithstanding the foregoing, the instant amendment of claim 7 further teaches away from Xue by reciting verbatim the limitations in original claim 13; that is to say, claim 7 is now limited to a joint thickness that is at least five-times the size of the largest particle contained in the joint compound. As such, claim 13 has been amended to recite a joint thickness that is between 5 and 500 times the size of the largest particle in the compound. Support for now amended claim 13 is found on page 8, lines 12-14 of the specification.

Nowhere does Xue anticipate or disclose the aforementioned "at least five times" limitation. This is because Xue does not deal with superplasticity. Nowhere does Xue discuss relative particle sizes/joint thicknesses. Contrary to the statement found in paragraph 2 of the latest Official Action, Xue does not in Column 2, lines 7-9 teach applying joint compound to a thickness at least five times the dimension of the largest particle. Rather, in that section, Xue merely states that joint thicknesses are to be between 25 microns and 2500 microns.

This is because Xue is not teaching a *method* for producing objects by plastic deformation. Xue is teaching a joint having specific physical attributes.

Indeed, none of the joint thicknesses in any of Xue's examples reflect the particle size/joint thickness relationship of the instant *method.* For instance, in Example 1 of Xue, the largest particle sizes (44 microns) are used to produce 150 micron joint thicknesses. This 150 micron joint thickness is *only 3.4 times* the particle dimension, not the at least 5 times limitation of the instant process. In Example 3 of Xue, 44 micron particles are used to produce 130 micron joint thicknesses. This 130 micron joint thickness is *less than three times* the particle dimension.

Not only does Xue not anticipate or teach a *method* for producing objects using the at least five times particle size/joint thickness relationship recited in claim 7, but Xue's joints exhibit joint thicknesses much less than five times the particle dimension. As such, the now amended claim 13, which recites a 500-fold relationship, is even more patentably distinct from Xue.

Xue does not anticipate or suggest the at least five times limitation as originally

recited in original claim 13. Furthermore, Xue does not anticipate or suggest the between 5 times and 500 times particle dimension/joint layer thickness relationship of now-amended claim 13.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Xue. Applicants disagree. Xue does not anticipate or suggest the limitation of claim 16 whereby 65 percent or more by volume of the joint compound (or objects to be joined) exhibits superplastic flow. Nowhere does Xue discuss superplastic flow or deformation. Rather, Xue utilizes *reactivity*, to bond joint constituents with themselves and to a lesser extent with the construct's components (See the quote above taken from the Xue patent.) The Applicants submit that reactivity of Xue's particles to cause bonding to each other is contra to sliding of particles around each other, which superplastic flow represents.

Pursuant to the Examiner's request, particle sizes are now recited in the claims. Specifically, claims 26 and 27 respectively recite 10 micron and 5 micron maximum particle sizes in the 65 percent superplasticity phase.

In light of the instant amendment, and the foregoing remarks, Applicants request that the §102 and §103 rejections based on Xue be withdrawn and that claims 7-13, and claims 25-26 and newly added claims 27-30 be allowed.

An earnest attempt has been made to respond to the March 9, 2004 Official Action in this matter. All claims are deemed in condition for allowance. If the Examiner feels that a telephonic interview with expedite allowance, he is respectfully urged to contact the undersigned. Claims 7-13, 25-26 are pending in the application. Allowance of these claims, and newly added claims 27-30 is hereby requested.

Respectfully solicited,

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